

WHAT IS CLAIMED IS:

1. A thermal transport apparatus comprising:
a substrate having a flow path of a liquid-phase working fluid and a path of a vapor-phase working fluid;
a wick member disposed on at least one main surface of the substrate;
a communicating hole provided in the substrate for communicating the flow path of the liquid-phase working fluid of the substrate with the wick member; and
grains filling in the communicating hole.
2. A thermal transport apparatus according to claim 1, wherein the substrate comprises two substrate layers so that the flow path of the liquid-phase working fluid and the flow path of the vapor-phase working fluid are formed between the two layers.
3. A thermal transport apparatus according to claim 1, wherein the communicating hole is filled with a mixture of a plurality of grains having different grain diameters, and the grain diameters are selected so that the grains having a second grain diameter are disposed in the spaces between the grains having a first grain diameter.

4. A thermal transport apparatus according to claim 1, wherein the communicating hole is filled with a plurality of grains having different grain diameters so that each group of the grains having a common grain diameter forms a layer, and the grain diameter of the layer decreases in the direction nearer to the wick member.

5. A thermal transport apparatus according to claim 1, wherein the wick member comprises a wick part comprising a group of the grains, and a base part for supporting the group of the grains constituting the wick part.

6. A method for manufacturing a thermal transport apparatus comprising:

a flow path forming step of forming a flow path of a liquid-phase working fluid and a flow path of a vapor-phase working fluid in a substrate;

a communicating hole forming step forming a first communicating hole for communicating the flow path of the liquid-phase working fluid with a main surface of the substrate and forming a second communicating hole for communicating the flow path of the vapor-phase working fluid with the main surface of the substrate;

a grain filling step of filling the first communicating

hole;

a bonding step of bonding a plurality of wick members to the main surface of the substrate so that the wick members communicate with the respective communicating holes; and

a supply step of supplying the working fluid to the flow path of the liquid-phase working fluid.

7. A method for manufacturing a thermal transport apparatus according to claim 6, further comprising a welding step of partially welding the surfaces of the adjacent grains filling in the first communicating hole.